VISION 21 WORKSHOP BREAKOUT SESSIONS

Breakout Session	Topics to be Covered (Examples)

Systems Analysis and Systems Integration	• **Systems Analysis**
	  Market Analysis
	  Process Evaluation
	• **Systems Integration**
	  Systems Engineering
	  Plant Operation
	  Industrial Ecology

Fuel Flexible Gasification	• **Advanced Gasifier** • **Gasifier Feed System**
Combustion and High Temperature Heat Exchange	• **Nitrogen-Free Combustion** • **Combustion Process for Syn-Gas Combustion External to Turbine** • **High Temperature Heat Exchange** • **Pressurized Solids Feed System – included in Gasification Roadmap** • **Advanced Sorbents for PFBC – included in Gas Purification Roadmap**
Gas Stream Purification	• **Control for Gas Contaminants – Syn-Gas/Power** • **Control for Gas Contaminants – Syn-Gas/Fuel Cells** • **Control for Gas Contaminants – Syn-Gas/Fuels** • **Control for Gas Contaminants – PFBC/Power** • **Particulate Control Technology** • **Combined Particulate/Gas Contaminant Control**
Gas Separation	• **Air Separation** • **Gas Separations – hydrogen** • **Gas Separations – carbon dioxide**
Turbines	• **Fuel Flexible Advanced Turbine** • **Turbines for Large Scale Fuel Cell Hybrid Systems** • **Hydrogen Turbine** • **Methane/Oxygen Turbine** • **Innovative Concepts**
Fuel Cells	• **Fuel Cell Sub-system** • **Fuel Processor** • **Power Conditioning** • **Fuel Cell Combined Cycle Systems**
Advanced Fuels & Chemicals	• **Syn-Gas Conversion for Fuels Product(s)** • **Syn-Gas Conversion for Chemicals** • **Hydrogen – included in Gas Separations Roadmap**
Materials	• **Gas Separation Membrane Materials** • **High Temperature/Pressure particle Filter Materials** • **High Temperature Erosion/Corrosion Resistant Materials** • **Joining Techniques**
Controls & Sensors	• **Process Control Technology (sub-systems and integrated plant)** • **Sensor Technology (Monitoring and Real-Time Diagnostics)** • **Inspection Technology**
Environmental Control Technology	• **Carbon Dioxide Capture** • **By-Product Waste Utilization** • **NOX Emissions Control** • **Mercury Removal** • **Waste Water Treatment**
Computational Modeling and Virtual Simulation	• **Plant Visualization (physical and process visualization)** • **Information System (includes data bases, architecture to access, …)** • **Mechanistic Modeling (modeling of fundamental phenomena)** • **Process Simulation (simulation of an integrated process)** • **Dynamic Simulation (simulation of the operation of coupled units)**